

WHAT IS CLAIMED IS:

1. A device for conducting binding reactions, said device comprising:
(a) two chambers in fluid communication, wherein one of said chambers
5 (larger chamber) has a volume that is greater than a volume of the other chamber
(smaller chamber), and
(b) an array of features comprising biopolymer probes, in each of the two
chambers.

10 2. A device according to Claim 1 wherein the chambers have capillary
dimensions.

15 3. A device according to Claim 1 additionally including instructions that the
chambers be exposed to an analyte having components of higher concentration which
will bind to the features in the smaller chamber and components of lower concentration
which will bind to features in the larger chamber.

20 4. A device according to Claim 1 for conducting hybridization reactions,
said device comprising two chambers in fluid communication, said chambers each
having an interior with capillary dimensions wherein one of said chambers has interior
dimensions that are larger (larger chamber) than the interior dimensions of the other of
said chambers (smaller chamber), each of said interiors comprising a linear microarray
25 of features comprising biopolymer probes, said smaller chamber comprising probes that
are directed to target molecules having expected concentrations in a sample solution that
are equal to or greater than a predetermined value and said larger chamber comprising
probes that are directed to target molecules having expected concentrations that are less
than said predetermined value.

30 5. A device according to Claim 1 wherein features of said larger chamber
comprise a greater number of biopolymer probe molecules than features of said smaller
chamber.

6. A device according to Claim 1 in communication with a detector.
7. An apparatus for conducting hybridization reactions, said apparatus
5 comprising:
 - (a) a housing having an interior with capillary dimensions wherein said interior comprises at least two chambers in fluid communication wherein one of said chambers has at least one interior dimension that is larger (larger chamber) than at least one interior dimension of the other of said chambers (smaller chamber), said interior comprising a microarray of features comprising biopolymer probes, said smaller chamber comprising probes that are directed to target molecules having expected concentrations in a sample solution that are equal to or greater than a predetermined value and said larger chamber comprising probes that are directed to target molecules having expected concentrations that are less than said predetermined value, and
 - 10 (b) a detector in communication with said housing.
8. An apparatus according to Claim 7 wherein said housing is part of a microfluidic system.
- 20 9. An apparatus according to Claim 7 wherein said detector is a CCD or a CMOS detector.
10. An apparatus according to Claim 7 further comprising a fluid dispensing device.
- 25 11. A device comprising an elongated web comprising a linear array of biopolymer features wherein said linear array is from 1 to 5 features in width and said elongated web comprises at least two chambers in fluid communication, said chambers each having an interior with capillary dimensions wherein one of said chambers has a volume that is larger (larger chamber) than the volume of the other of said chambers (smaller chamber), said smaller chamber comprising probes that are directed to target molecules having expected concentrations in a sample solution that are

equal to or greater than a predetermined value and said larger chamber comprising probes that are directed to target molecules having expected concentrations that are less than said predetermined value.

5 12. A method for conducting binding reactions, said method comprising:
 (a) introducing a sample into a device according to Claim 1 wherein said biopolymer probes bind to components in said sample, and
 (b) incubating said sample in said housing under conditions for carrying out said binding reactions.

10

13. A method according to Claim 12 wherein said binding reactions are hybridization reactions.

14. A method according to Claim 13 further comprising examining said array
15 for the results of said hybridization reactions.

15 A method according to Claim 14 wherein said examining is conducted using a detector in communication with said device.

20 16. A method according to Claim 15 wherein said detector is a CCD or a CMOS detector.

17. A method according to Claim 18 wherein said biopolymer probes are polynucleotides or polypeptides.

25

18. A method comprising forwarding data representing a result obtained from a method according to Claim 17.

30 19. A method according to Claim 18 wherein the data is transmitted to a remote location.

20. A method comprising receiving data representing a result obtained from a

method according to claim 17.

21. A method according to claim 12 wherein features in the larger chamber bind to higher concentration components in the sample and features in the smaller
5 chamber bind to lower concentration components in the sample.

22. A method for conducting hybridization reactions, said method comprising incubating a sample comprising target molecules in a capillary environment such that a portion of said sample is in contact with an array of features comprising
10 biopolymer probes that are directed to target molecules having expected concentrations in said sample that are equal to or greater than a predetermined value, and a portion of said sample is in contact with an array of features comprising biopolymer probes that are directed to target molecules having expected concentrations in said sample that are less than a predetermined value.

15

23. A method according to Claim 22 further comprising examining said array for the results of said hybridization reactions.

24. A method according to Claim 23 wherein said examining is conducted
20 using a detector in communication with said device.

25. A method according to Claim 22 wherein said biopolymer probes are polynucleotides or polypeptides.